CHAPTER THREE

PREPARATION OF THE PEA REPORT

This chapter provides guidance on how to organize the PEA report and what information should be included in the report. The purpose of the report is to document the results of the PEA investigation and screening evaluations and to recommend a course of action for the site.

3.1 DOCUMENTATION GUIDELINES

The following guidelines are presented to facilitate both the preparation of the PEA report and the Department's review and approval process.

- All data provided in the report should be presented as clearly and concisely as possible. The use of lists, bulleted outlines, tables, and figures are preferred over long narrative discussions.

- Avoid the use of large blocks of text unbroken by headings, graphics, tables or other visual organizers.

- References, photographs, laboratory analytical reports, and any other items which are used to substantiate statements in the PEA report should be attached as appendices.

3.2 SUGGESTED REPORT FORMAT

To provide consistency in documentation of PEA investigations, the Department recommends use of the report format provided in Figure 3.1.

3.3 REQUIRED REPORT CONTENTS

The specific information that must be included in the PEA report is discussed in the following section. Refer to these pages for guidance when preparing the report. If any information required cannot be obtained, a statement to that effect must be included in the report. If required information is omitted because it seems irrelevant to the site, the rationale for this omission must be included in the report. Omission of required information and rationale for omission are subject to approval by Department staff.

3.3.1 EXECUTIVE SUMMARY

The executive summary is the most complete summary of the site. This section should inform the reader of all the major aspects of the site. Specifically, this section should include, but not be limited to, very brief descriptions of the following:

- purpose of investigation;
- site background and current status;
- known and potential releases;
- significant contamination;
- pathways demonstrating potential threat;
- potentially exposed populations; and conclusions and recommendations.

3.3.2 INTRODUCTION

This section should briefly introduce the site and the organization of the report. In doing so, the preparer should provide the reason for performing the PEA

FIGURE 3.1: SUGGESTED REPORT FORMAT

- i. Table of Contents
- ii. List of Figures
- iii. List of Tables
- iv. List of Appendices

Executive Summary

I. Introduction
- A. Purpose and Scope of Work

II. Site Description
- A. Site Identification Information
- B. Site Maps
  1. General Location Map
  2. Detailed Site Diagram

III. Background
- A. Site Status/Historical Site Information
- B. Hazardous Substance/Waste Management Information

IV. Apparent Problem

V. Environmental Setting
- A. Factors Related to Soil Pathways
- B. Factors Related to Water Pathways
  1. Ground Water Pathway
  2. Surface Water Pathway
- C. Factors Related to Air Pathways

VI. Sampling Activities and Results
- A. Summary of Activities
- B. Presentation of Data
- C. Discussion of Results

VII. Human Health Screening Evaluation
- A. Exposure Pathways and Media of Concern
- B. Exposure Point Concentrations and Chemical Groups
- C. Toxicity Values and Summary Tables
- D. Risk Characterization and Summary Tables
- E. Uncertainty Analysis

VIII. Ecological Screening Evaluation
- A. Site Characterization
- B. Biological Characterization
- C. Pathway Assessment
- D. Qualitative Summary

IX. Community Profile

X. Conclusions and Recommendations
- A. Summary and Conclusions
- B. Recommendations for Further Action
- C. Preliminary Scoping Recommendations

XI. References

XII. Supporting Documentation (Appendices)

investigation; the types and years of site operations; and the guidance documents followed during the investigation.

3.3.3 SITE DESCRIPTION

The site description should include information that identifies the physical setting of the site in relation to the surrounding area.

3.3.3.1 SITE IDENTIFICATION

The following information must be included in this section of the PEA report.

1) **Site Name:** Name of current business operation and/or land use at the site.

2) **Contact Person(s):** Name of the main contact person(s) for the above cited operation.

3) **Site Address:** Street address or nearest cross streets, city, state, county and zip code.

4) **Mailing Address:** Mailing address for the site if different from the street address (e.g., P.O. Box or off-site business).

5) **Phone Number:** Phone number of any on-site or off-site business office.

6) **Other Site Names:** Former or alternate names for the current and historical operations on-site.

7) **USEPA Identification Number:** If assigned.

8) **CalSites Database Number:** If assigned.

9) **Assessor's Parcel Number and Maps:** Parcel number(s) for the site and copy of the County Assessor's plat map for the parcel(s) where the site is located.

10) **Township, Range, Section, and Meridian:** Corresponding to the site location.

11) **Land Use and Zoning:** Current land use and zoning and any proposed land use or zoning changes. Land use categories may include, but are not limited to: commercial; industrial; institutional; single family residential; multi-family residential; cultivated land; pasture or range land; wood or forest land; meadow; open grass areas (e.g., parks, golf courses, cemeteries, etc.); paved lots (e.g., parking lots, storage areas, etc.); public easements/right-of-ways (e.g., roads, utilities, pipelines, water canals, etc.); or landfills.

3.3.3.2 SITE MAPS

At a minimum, a site location map and a site specific map (facility diagram) should be prepared. The site location map should show the general location of the site relative to its surrounding area (scale 1:2400). The site location map should identify major highways, surface waters, land use, sensitive populations and critical habitats. The site specific map should include all significant site features (buildings, tanks, ponds, sumps etc.), both current and historical, and should be drawn to a scale appropriate for the site size. All maps should be oriented with north at the top of the page.

3.3.4 BACKGROUND

3.3.4.1 SITE STATUS AND HISTORY

Each data element below should be provided for all current and past business operations at the site.

1) **Business Type:** Identity and description of the types of businesses which are currently operating or have operated at the site in the past.
2) **Years of Operation:** Operating dates for each business identified.

3) **Prior Land Use:** Identity of the land use prior to development of the site (including the placement of fill upon the property).

4) **Facility Ownership/Operators:** Identity of all persons or corporations which owned and/or operated businesses on the site. Description of the organizational structure of the businesses (corporation, limited partnership, etc.). Names of operators, partners, and/or any person(s) having operational control of the facility. Description of the roles these persons/corporate officers played in the day-to-day operations at the site. Current street addresses, mailing addresses, and phone numbers for each person and/or corporation identified.

5) **Property Owners:** Narrative summary of the property ownership at the site extending back to the date of first business operations. The narrative should reference title documents and tax assessor parcel maps which should be included as appendices. The narrative should also include current street addresses, mailing addresses, and phone numbers for all persons/corporations identified.

6) **Surrounding Land Use:** History and/or general uses of properties in the area surrounding the site should be researched to the extent to which the information is useful to determine the influence of surrounding property use(s) on the site.

3.3.4.2 HAZARDOUS SUBSTANCE/ WASTE MANAGEMENT INFORMATION

The following information regarding hazardous substance/waste management activities for all current and former businesses that have operated on-site should be provided in the PEA report.

1) **Business/Manufacturing Activities:** Concise description of activities or manufacturing processes for each business currently and formerly operating on-site which utilized or generated hazardous substances/wastes. Summary descriptions, diagrams, flow charts, and/or tables are preferable to long narrative descriptions. At a minimum the following information should be provided.

    a) Type and approximate quantities of products produced/sold per year or the number of services rendered per year.

    b) Amount/type of hazardous substances and/or wastes generated per year.

    c) Primary materials and chemicals used, handled, or sold on-site.

    d) Descriptive overview of the major physical/chemical processes used (e.g. mixing, distillation, combustion, oxidation, polymerization, etc.) for each process or activity.

2) **On-Site Storage, Treatment, and Disposal:** Provide a concise description of hazardous waste/substance storage, treatment, and disposal practices for each business currently and formerly operating on-site. Summary descriptions, diagrams, flow charts, and/or tables are preferable to long narrative descriptions. At a minimum the following information should be provided.

   a) Type, capacity, contents, and location of hazardous substance/waste storage units on-site (e.g. tanks, drum storage areas, sumps, pits, ponds, etc.).

   b) Type, capacity, and location of hazardous waste treatment facilities on-site (e.g. neutralization, filtration, distillation, incineration, etc.).

   c) Hazardous waste disposal practices on-site (e.g. land disposal, land spreading, injection, etc.). Include volume of waste disposal over time.

   d) Hazardous substance and/or waste containment measures specific to each treatment, storage, and disposal unit on-site.

   e) Waste recovery and/or recycling practices utilized on-site. Indicate volumes and types of wastes recovered/recycled annually.

   f) Origin, types, and quantities of any hazardous substances/wastes from off-site sources treated, disposed, or stored on the site.

   g) Identification of all leaks, spills, releases or threats of releases of any hazardous substances at or from the site (into the environment or within on-site structures). Include when, how, and where such releases occurred and the volume and types of materials released.

3) **Regulatory Status:** Provide the status of any federal, state, or local hazardous substance/waste permits currently or previously held by the facility. Include effective dates of the permit(s) and specific permit requirements and conditions. Attach copies of the permits in the appendices of the PEA report.

4) **Inspection Results:** Summarize significant findings of federal, state, or local inspections of current or past operations on-site. Include significant sampling results, scope and purpose of the inspection, and conclusions drawn by the inspector.

5) **Prior Assessments/Remediation:** Identify, evaluate and summarize results of all assessments, sampling efforts and cleanup activities which have taken place at the site prior to the PEA.

3.3.5 APPARENT PROBLEM

This section should summarize the available information regarding known or potential sources of contamination which constitute the primary reason for investigating the site. The summary should include documentation of spills or releases (date, location, material, quantities), identification of the contaminants of concern, identification of the primary human and environmental resources of concern, and a description of the exposure pathways. Detailed information related to the apparent

problem should be described in subsequent sections of the report.

3.3.6 ENVIRONMENTAL SETTING

During the Background Research for the PEA, information should have been collected regarding the site's environmental characteristics. This information identifies the site environmental conditions which would influence the transport of contaminants from the source of contamination through identified potential exposure pathways to the exposed individual or environmental receptor. The Department will use the information provided to prioritize those sites which require remediation.

3.3.6.1 FACTORS RELATED TO SOIL PATHWAYS

1) Describe the topography of the site and the surrounding areas.

2) Describe any evidence of environmental impacts from a release at the site (e.g., stained soil, stressed vegetation, dead or ill wildlife, etc).

3) Describe the predominant soil groups for the site. Use site specific geologic logs when available. Identify the least and most permeable continuous layers of soil and the permeability of each layer.

4) Describe the surface slope at the site. Also, provide the slope of any intervening terrain between the site and the nearest downhill surface-water body. If the site is in a closed basin or actually located in surface water, this fact should be stated.

5) Describe accessibility to the site in terms of both natural and man-made features or structures which currently restrict human access to the site.

6) Describe any measures which have been taken to contain or prevent direct contact with hazardous substances in or on the soil at the site.

7) Provide the distance to and location of the nearest potentially affected residential area, school, business, day care center, nursing home, senior citizen community, and hospital (for facilities within one mile of the site).

3.3.6.2 FACTORS RELATED TO WATER PATHWAYS

If a release or threatened release of hazardous substances to water exists at the site, then the following information must be provided.

1) Describe the hydrogeology beneath the site in terms of known aquifers, depth to aquifers, hydraulic conductivities, confining layers, discontinuities, aquifer interconnections, and any other features of significance.

2) Identify the aquifers which have been contaminated by a release from the site, or which are threatened to be contaminated as a result of migration of hazardous substances from a release at the site. Identify any aquifers which are interconnected with an aquifer that has been contaminated by a release from the site.

   Data source: Sampling data; Local water districts utilities; County health departments; Department of Health Services, Public Water Supply Branch; DWR; RWQCB.

3) For each of the aquifers identified above, provide the following

information for wells within a three-mile radius of the site:

a) The use(s) of ground water from wells which draws from the aquifer(s) (e.g., drinking water, irrigation, industrial process water, etc.).

b) The distances to the nearest well and nearest drinking water well which draw from the aquifers(s).

c) The direction and velocity of flow within the aquifer(s).

d) The approximate number of service connections and population served by drinking water wells from the aquifer(s).

Data source: Local water districts and utilities; County planning and health departments; Local irrigation districts; Department of Health Services, Public Water Supply Branch; DWR; USGS; RWQCB.

4) Describe the possible migration route(s) from the areas of hazardous substance contamination and/or storage to nearby surface waters, marshlands, wetlands, or wildlife habitats in the event of surface water runoff or flooding.

Data source: Personal observation; aerial photographs; USGS Maps.

5) Describe the locations and uses of surface waters, marshlands, wetlands, and wildlife habitats which may be potentially affected by migration of contaminants from the site. Also, provide the location and distance to the nearest surface water, marshland, wetland, and wildlife habitat which may be affected by migration of the contaminants.
Data source: USGS Maps; other maps; Department of Fish and Game; local planning department; U.S. Bureau of Reclamation; SWRCB.

6) Describe any past or existing measures for preventing or mitigating surface water runoff from the site (e.g., berms, diversion systems, diking, sealed containers for hazardous substances, runoff collection systems, etc.).

Data source: Facility records; Department files; RWQCB files.

7) Identify the approximate population served (number of people drinking water) by each surface water intake within three (stream) miles downstream of the probable point of entry of runoff from a site to a stream/river and one mile from the probable point of entry to a static body of water. Also identify the approximate number of acres of food/forage cropland irrigated by water from each intake and the approximate number of livestock or poultry which consume water from each intake.

Data source: U.S. Census Bureau; Local/regional planning health departments; Department of Health Services, Public Water Supply Branch; Local irrigation districts; DWR.

8) Provide the approximate slope (in percentage) of the site and the intervening terrain between the site and any surface water which may potentially accept runoff.

3.3.6.3 FACTORS RELATED TO AIR PATHWAYS

Information for this section needs to be provided only if sampling data exists to document a release of a hazardous substance to the atmosphere or if the threat of a release exists. The threat of a release exists if hazardous substances (including contaminated soils) on the site are subject to wind dispersal, evaporation, dispersal from fire/explosion, or if dispersal of the hazardous substances has been observed visually. If a release has been documented or a threatened release exists at the site, provide the following information.

1) Describe the known or potential sources(s) and mechanism for the release or threatened release.

   Data source: Site records; local air quality district.

2) Provide the daily prevailing wind direction and daily average velocity for the site.

   Data source: Local air district; local weather stations.

3) Describe local climatic factors (e.g., seasonal temperatures, seasonal precipitation, seasonal temperature inversions, seasonal wind patterns, and seasonal extreme events).

   Data source: Local air quality districts; local weather stations.

4) Describe the timing of the release or threatened release (e.g., intermittent release related to facility operation, continuous release from an impoundment, potential release if heavy machines disturb soils, etc.).

   Data source: Facility records; local air quality district.

5) Describe the possible dispersion route(s) for a release or threatened release (e.g., via a stack emission, evaporation, wind, fire/explosion, etc.).

   Data source: Local air quality districts, facility records.

6) Provide the approximate population of residents and workers which may be affected by a release or threatened release of hazardous substances.

   Data source: U.S. Census Bureau; local/regional planning databases.

7) Provide the location and distance from the site to any of the following areas which may be impacted by a release or threatened release of hazardous substances:

   - commercial/industrial;
   - national/state parks, forests, wildlife reserves, and residential areas;
   - agricultural lands (in production within five years) for both prime and non-prime agricultural land; and
   - historic/landmark sites.

   Data source: Local planning departments; Department of Food and Agriculture; DWR; Department of Forestry; maps

8) If not previously indicated in other sections of the PEA report, provide the type, location, and distance from the release or threatened release of hazardous substances to the following sensitive environments:

- Schools
- day care centers
- hospitals
- nursing homes
- retirement communities
- any other sensitive populations

- coastal wetlands (within a two-mile radius);
- fresh-water wetlands (within a one-mile radius); and
- habitat for special species (within a one-mile radius).
- national parks

Data source: Local planning department, maps, NDDB, DWR, SWRCB, physical measurement.

3.3.7 SAMPLING ACTIVITIES AND RESULTS

In the three subsections that follow, the report should summarize the sampling activities performed, present the analysis data, and provide a discussion of the results.

3.3.7.1 SUMMARY OF ACTIVITIES

The sampling plan provided a framework for field activities and allowed flexibility for some decisions to be made in the field. This section should describe the activities that were performed, document decisions made in the field and identify any deviations from the sampling plan and their rationale. Also include information regarding the handling of analytical samples from the time of collection until final analysis.

3.3.7.2 PRESENTATION OF DATA

Use tables, charts, etc. to summarize the sample analysis results for each medium. At a minimum the information presented should include the chemical name, sample type, sample # or location, sample depth (if appropriate), detection limit, units, and date collected. Analysis results as reported from the lab, including QA/QC data should be provided in an appendix to the report.

3.3.7.3 DISCUSSION OF RESULTS

Provide a summary of the conclusions reached upon evaluation of the analytical data. Identify unexpected or conflicting results, unusable data, and field and/or laboratory interferences and provide potential rationale. This section should also identify secondary analysis performed to confirm original results that may have been questionable.

3.3.8 HUMAN HEALTH SCREENING EVALUATION

The introduction to the Human Health Screening Evaluation is to contain a brief summary of the information presented in the remainder of the section. The summary should introduce the four components of the human health screening evaluation (3.3.8.1 - 3.3.8.4) and describe the primary purpose of each component as it applies to the site.

3.3.8.1 EXPOSURE PATHWAYS AND MEDIA OF CONCERN

Use a Conceptual Site Model to show potential exposure pathways (See Figure 2.1 for example). If there are several distinct areas of contamination, the use of a separate Conceptual Site Model for each area is acceptable for clarity. If the pathways of exposure are the same for each area, only one model is needed; however, a statement to that fact is required. Also include a detailed description of each significant pathway and state if the release is actual or threatened (also state if the release is continuous, intermittent, etc.). Provide a qualitative rationale if a particular exposure pathway is to be excluded from evaluation. The exposed population for each potential pathway is to be included with this section.

3.3.8.2 EXPOSURE CONCENTRATIONS AND CHEMICALS

In this section include tables identifying the chemicals of concern, their physical constants and the concentrations for each medium that were used as input

for the screening evaluation (this should be displayed for each separate area of contamination). Every table is to have a descriptive title name and the name of the potentially contaminated area it represents if applicable. If the site has historic sampling data, significant results should be included in separate, chronological tables with each table clearly noting the sampling date. If there are large volumes of data, include only the significant findings in this section and include all other data in an appendix. Provide the rationale if a particular chemical is to be excluded from evaluation. All background data should be included in this section, with any suspected anomalies noted. A table can be used to compare metals found on site with background levels.

3.3.8.3 TOXICITY VALUES

Each chemical of concern should have all relevant and significant human toxicity information described. This is to include a summary table with the cancer potency factor and reference dose for each chemical of concern, and each route of exposure. The table should reference the source and date of the toxicity values (e.g., Cal/EPA, IRIS, HEAST), and not the toxic endpoint or target organ of concern. Toxicity data for each route can be displayed in a table along with the risk associated for that pathway. This section should clearly indicate which toxicity values are based on cross route extrapolation.

3.3.8.4 RISK CHARACTERIZATION SUMMARY

The risk characterization summary should integrate the exposure assessment and chemical toxicity information. Significant findings and determinations are to be included in this section, such as the risk and hazard for each chemical and each exposure pathway. The summation of cancer risk and hazard over all chemicals and exposure routes should also be included. Conclusions regarding the screening evaluation determinations are to be described in this section.

The risk and hazard estimated which result from application of this screening evaluation do not represent absolute estimates at a specific site, since generic assumptions for residential land use were used. The information provided for the PEA screening evaluation is often based on limited sampling information. The goal of the PEA screening evaluation is to insure that no potential health hazard is overlooked; therefore, the screening evaluation's assumptions and default values are restricted to a reasonable maximum exposure scenario. Providing a list of the assumptions used in the screening evaluation in this section of the report could provide the reader with useful insight into the conservative nature of the evaluations.

3.3.9 ECOLOGICAL SCREENING EVALUATION

The introduction to the Ecological Risk Assessment is to contain a summary of the information presented in this section of the PEA Report.

3.3.9.1 SITE CHARACTERIZATION

A description of the site and the general ecology proximal to the site is to be described, noting locations of any nearby wildlife habitats.

3.3.9.2 BIOLOGICAL CHARACTERIZATION

List and describe all wildlife habitats potentially affected by the site. The nature of the habitat should be detailed including cyclic changes. The rationale for excluding any nearby wildlife habitat from evaluation should be provided.

List all special species potentially impacted by the site. State if any of these species have been observed on the site. Note if a species is particularly sensitive to any chemicals of concern found on site.

3.3.9.3 PATHWAY ASSESSMENT

Describe the onsite contamination and the potential exposure pathways to the environment. Use a Conceptual Site Model to illustrate general potential exposure pathways, then a more detailed exposure pathway analysis table can be used for each habitat. Include a discussion on whether this exposure is onsite or offsite and describe the potentially affected species. Any past documented or observed impacts to wildlife habitats or special species from the site is to be described in this section. Also describe any interim remedial measures that may abate potential impacts to the environment from the chemicals of concern.

3.3.9.4 QUALITATIVE SUMMARY

Provide a qualitative description of the magnitude, duration, and frequency of exposure for the various biological receptors, representing multiple trophic levels, for each contaminant or area of contamination. Conclusions regarding current or potential environmental impacts are to be included. If the site contamination does not impact the environment, a qualitative statement to that affect and supporting rationale should be provided. In addition, statements should also be made that areas currently or potentially impacted by the site are not utilized by non-human receptors and/or do not contain wildlife habitats or endangered or threatened species (if that is the case).

3.3.10 COMMUNITY PROFILE

This section should be a summary of the community profile prepared as part of the PEA investigation. The summary should highlight the assessment of community concern and the public participation actions taken. Also include any recommendations for future public participation activities. If a community profile was not prepared during the PEA investigation, provide the rationale for its omission.

3.3.11 CONCLUSIONS AND RECOMMENDATIONS

3.3.11.1 SUMMARY AND CONCLUSIONS

The conclusions of the PEA report need to address three main questions:

- Have current or past practices of handling hazardous waste/substances resulted in a release or threat of release at the site;
- If a release has occurred or a threatened release exists, does it pose a significant threat to public health or the environment; and
- Does the release pose an immediate potential hazard to public health or the environment which would require the implementation of an expedited response action.

In answering the above questions, the conclusions should be specific, concise, and supported by information presented in the body of the report. All conclusions presented in this section must be consistent with the data and analysis presented elsewhere in the PEA report.

If a release or threatened release does not exist, this section should include a statement to that effect and reference

the information contained in the body of the report which supports the statement.

3.3.11.2 RECOMMENDATIONS

Based on the conclusions presented in the previous section, the preparer will make a recommendation(s) regarding the need for further action at the site. In its simplest form the recommendation will either be "no further action" or "additional action required".

A "no further action" recommendation can be made in cases when no release of hazardous substances has occurred and in cases when levels of contamination are determined to be insignificant. Any recommendations for "no further action" at sites where a release has been documented must be supported by information provided in the human health and environmental threat evaluation portion of the report.

At sites with significant contamination, a recommendation for further action to investigate or remediate the site must be made. This recommendation should not simply state that "further action is required". The recommendation should identify additional investigation and/or remediation needs and strategies to address them.

In addition to the recommendations above for long term actions, this section must include recommendations for expedited response actions necessary to mitigate any immediate potential hazards to public health or the environment. These actions can take a number of forms, including but not limited to: removing highly contaminated soils to prevent further migration; placing a polymer coating onto soils to prevent dispersion and runoff; placing a fence and warning signs around contaminated areas to prevent direct contact; and/or providing alternative drinking water sources to residents near sites where drinking water supplies are contaminated. When determining if expedited response actions are required, consider the following:

- Does the site have unrestricted access?
- Are there hazardous substances in surface impoundments, unsealed or improper containers, piles, leaking tanks, or other unapproved storage?
- Have the substances been spilled on the ground or other surfaces accessible to humans or animals?
- Does the toxicity of the hazardous substances at the site pose an immediate public health or environmental endangerment?
- What is the most immediate exposure threat facing nearby populations?
- How many people live or work around the site and what is the distance of that population from the site?
- Is there a confirmed instance in which exposure to hazardous substances at a site has caused injury, illness, or death to humans, domestic or wild animals, or plants?
- Can it reasonably be inferred from the geology and hydrology of the site and surrounding area and the nature of the contaminants that there is the potential for off-site migration?
- Is there evidence of off-site migration?
- Are there active wells in the suspected pathway of migration?
- Is there a potential for the contaminant to become airborne?

- Can a reasonable inference be made that taking an immediate action could significantly reduce continued or potential hazardous substance migration from the site through air emissions, surface water runoff, groundwater migration, or subsurface gas migration?

3.3.11.3 PRELIMINARY SCOPING RECOMMENDATIONS

For sites that will continue in the Site Mitigation Process, the next step after completing the PEA is the RI/FS . The RI is conducted to characterize the full extent of contamination at the site and to obtain information needed to identify, evaluate, and select cleanup alternatives. The FS includes an analysis of remediation alternatives based on the nine National Contingency Plan (NCP: USEPA 1988a) evaluation criteria.

The first step of the RI/FS is the planning or scoping of the project to focus activities and streamline the process, thereby preventing needless expenditures and loss of time in unnecessary sampling and analysis. Ideally, all sites would begin the RI/FS immediately upon completion of the PEA. Unfortunately, due to limited resources, most sites experience a lag time between the PEA and initiation of the RI/FS. In order to take full advantage of the interim and maintain the momentum of the investigation, this section will include steps to scope the RI/FS upon completion of the PEA. These steps will serve to identify potential data gaps, keep information on site conditions current, and help establish priorities for future remedial actions. Upon approval of the PEA report, the parties responsible for the site should initiate the implementation of the scoping activities identified in the report.

Specific activities that may be conducted during project scoping include:

- Evaluating the PEA data to update the conceptual site model and identify data gaps.

- Initiating limited field investigations if available data are inadequate to develop an updated conceptual site model and adequately scope the project. An example of limited field investigation would be installation of monitoring wells and/or collecting samples from existing wells on a quarterly basis to monitor for the chemicals of concern or hydrological studies.

- Identifying preliminary remedial action objectives and likely response actions for the specific projects. This may include identifying the need and the schedule for treatability studies to better evaluate potential remedial alternatives.

    - Conducting treatability studies identified in scoping.

    Full project scoping activities can be found in the USEPA's Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Potential scoping needs applicable to baseline risk assessment data collection can be found in USEPA's Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A).

GLOSSARY

ANNUAL WORKPLAN. A key element in the Department's management and planning process. This planning document allocates resources to the highest priority work to be accomplished.

COMMUNITY ASSESSMENT. A series of interviews with local community members which will aid the Department in characterizing and determining the informational needs and desires of the community. (DTSC)

COMMUNITY PROFILE. A written presentation of information gathered through the community assessment regarding community concerns that form the basis for determining public notification and public participation needs.

CONCEPTUAL SITE MODEL. A "model" of a site developed at scoping using readily available information. Used to identify all potential or suspected sources of contamination, types and concentrations of contaminants detected at the site, potentially contaminated media, and potential exposure pathways, including receptors. This model is also known as "conceptual evaluation model". (USEPA, 1991b)

CONTINUOUS CORE. A continuously retrieved cylindrical or columnar piece of solid rock or section of soil, usually 5-10 cm in diameter, taken as a sample of an underground formation by a special hollow-type drill bit, and brought to the surface for geologic examination and/or chemical analysis. It records the entire section of the rock or soil penetrated. (Definition adapted from "Glossary of Geology", American Geological Institute, 1977)

EXPEDITED RESPONSE ACTION. A removal action which occurs during or soon after the site evaluation phase. These removals generally consist of removing leaking drums/tanks, fencing the site, and placing caps of protective covering over known areas of contamination.

EXPOSURE POINT. A location of potential contact between an organism and a chemical or physical agent. (USEPA, 1991b)

EXPOSURE ROUTE. The way a chemical or physical agent comes in contact with an organism (i.e., by ingestion, inhalation, dermal contact). (USEPA, 1991b)

FIELD DUPLICATES. Independent samples which are collected as close as possible to the same point in space and time. They are two separate samples taken from the same source, stored in separate containers, and analyzed independently. These duplicates are useful in documenting the precision of the sampling process. (USEPA, 1986)

HAZARD INDEX (HI). The sum of two or more hazard quotients for multiple substances and/or multiple exposure pathways. (USEPA, 1991b)

HAZARD QUOTIENT (HQ). The ratio of a single substance exposure level over a specified time period to a reference dose for that substance derived from a similar exposure period. (USEPA, 1991b)

PRELIMINARY REMEDIATION GOALS (PRGS). Initial clean-up goals that (1) are protective of human health and the environment and (2) comply with Applicable or Relevant and Appropriate Requirements. They are developed early in the process based on readily available information and are modified to reflect results of the baseline risk assessment. They also are used during analysis of remedial alternatives in the remedial investigation/feasibility study. (USEPA, 1991b)

QUANTITATION LIMIT. The lowest level at which a chemical can be accurately and reproducibly quantitated. Usually equal to the instrument detection limit multiplied by a factor of three to five, but varies for different chemicals and different samples. (USEPA, 1991b)

REFERENCE CONCENTRATION(RfC). An estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. Expressed as a concentration of contaminant in air (mg/m^3). (Adapted from IRIS database, July 1, 1990)

REFERENCE DOSE (RfD). An estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime. Expressed in mg/kg of body weight per day. (Adapted from IRIS database, July 1, 1990)

REMEDIAL ACTION. (a) Those actions which are consistent with a permanent remedy, that are taken instead of, or in addition to, removal actions in the event of a release or threatened release of a hazardous substance into the environment... (DTSC, 1991)

(b) Those actions which are necessary to monitor, assess, and evaluate a release or a threatened release of a hazardous substance. (DTSC 1991)

REMOVAL (ACTION). Includes the cleanup or removal of released hazardous substances from the environment or the taking of other actions as may be necessary to prevent, minimize, or mitigate damage which may otherwise result from a release or threatened release.... (DTSC 1991)

RISK-BASED PRGS. Concentrations levels set at scoping for individual chemicals that correspond to a specific cancer risk level of 10^{-6} or an HQ/HI of 1. They are generally selected when ARARs are not available. (USEPA, 1991b)

SLOPE FACTOR (SF). A plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The slope factor is used to estimate an upper-bound probability of an individual's developing cancer as a result of a lifetime of exposure at a particular level of a potential carcinogen. (USEPA, 1991b)

SPLIT SAMPLES. Aliquots of sample taken from the same container and analyzed independently. These are usually taken after mixing or compositing and are used to document intra- or interlaboratory precision. (USEPA, 1986)

VADOSE ZONE. The zone between the land surface and the water table. (DTSC, 1991)

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